

Geographical Information Systems (GIS) Applications for Habitat Restoration

2003 Arid Southwest Lands Habitat Restoration Conference

Debra L Hughson, Science Advisor
National Park Service
Mojave National Preserve

with help from Mojave Desert Ecosystem Program

www.mojavedata.gov

2002 10 27

Three Uses of GIS Technology for Habitat Restoration

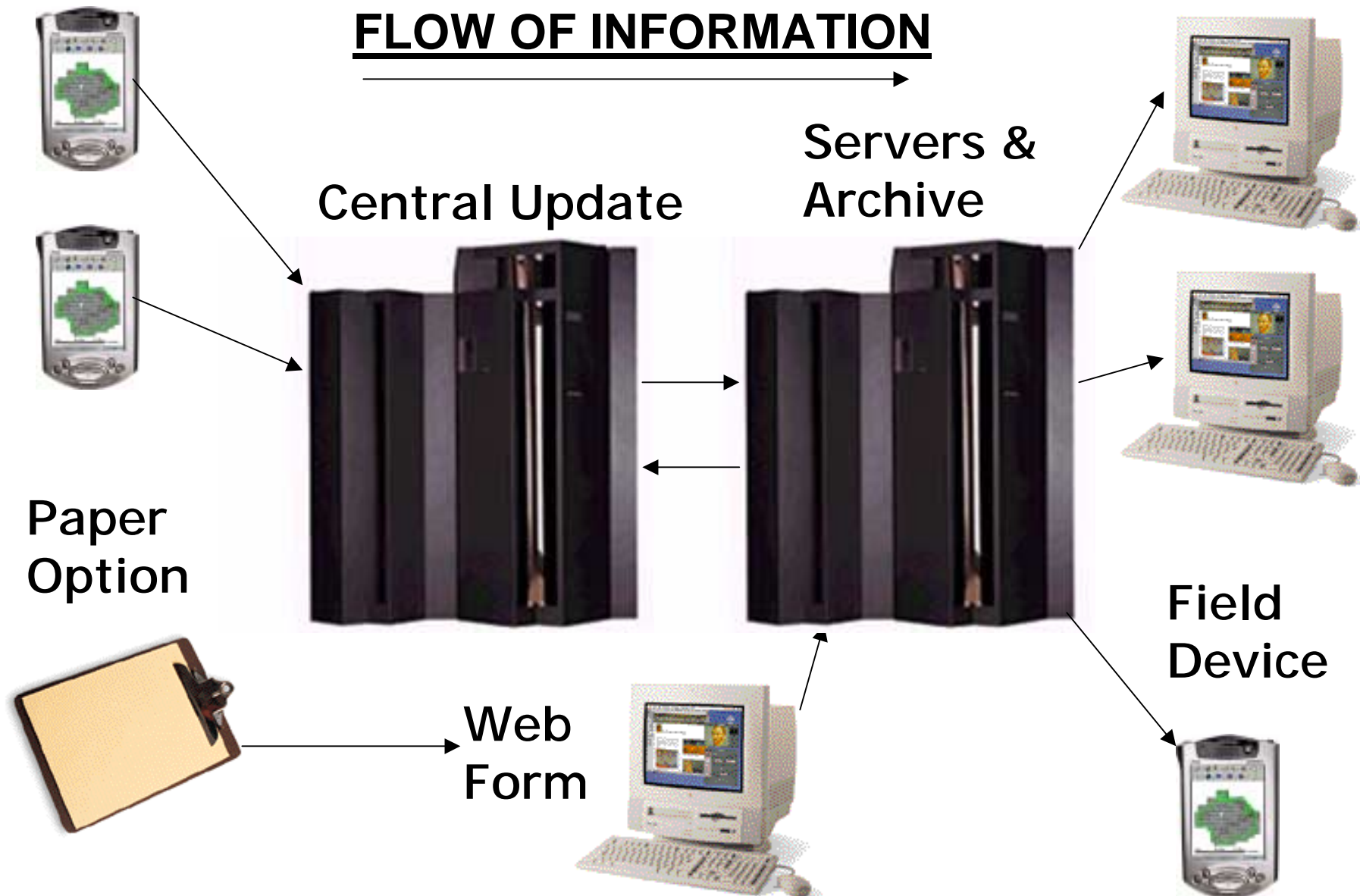
- **Digital data collection**
 - *Inventory*
- **Modeling analysis**
 - *management decisions*
- **Monitoring**
 - *time component*

Field Data

Digital Data Collection

Web Access

FLOW OF INFORMATION



Digital Data Collection

Total \$1744

Compaq iPAQ
ArcPad 6

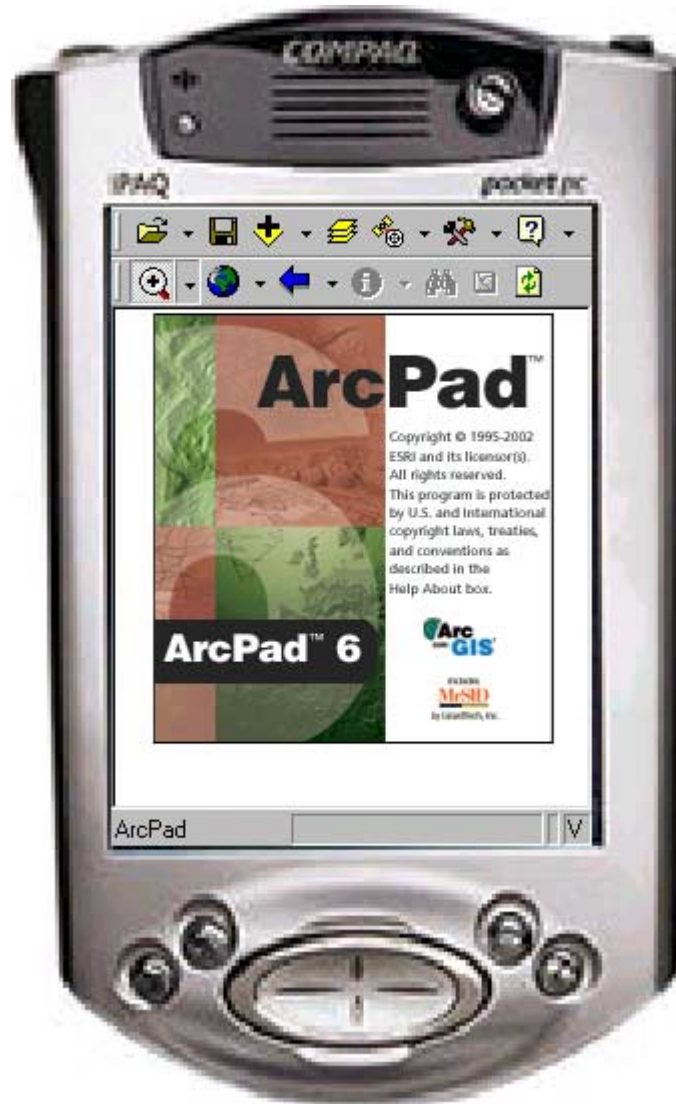
\$1195.00

PC Card Pack &
5 GB Hard Card

\$349.00

GPS and cord

~ \$200.00

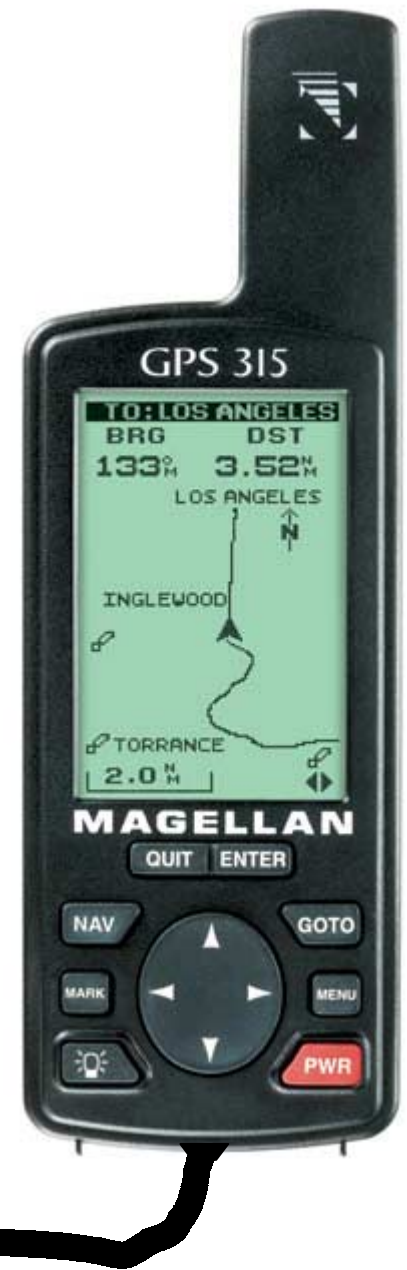
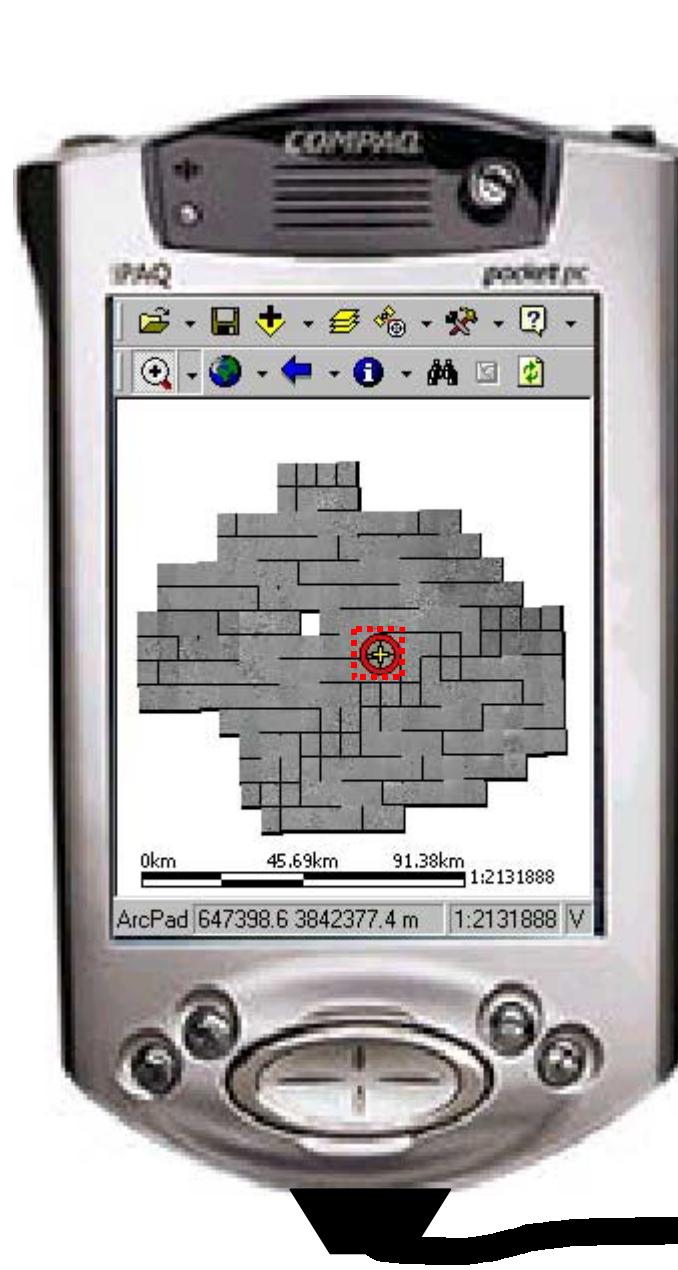


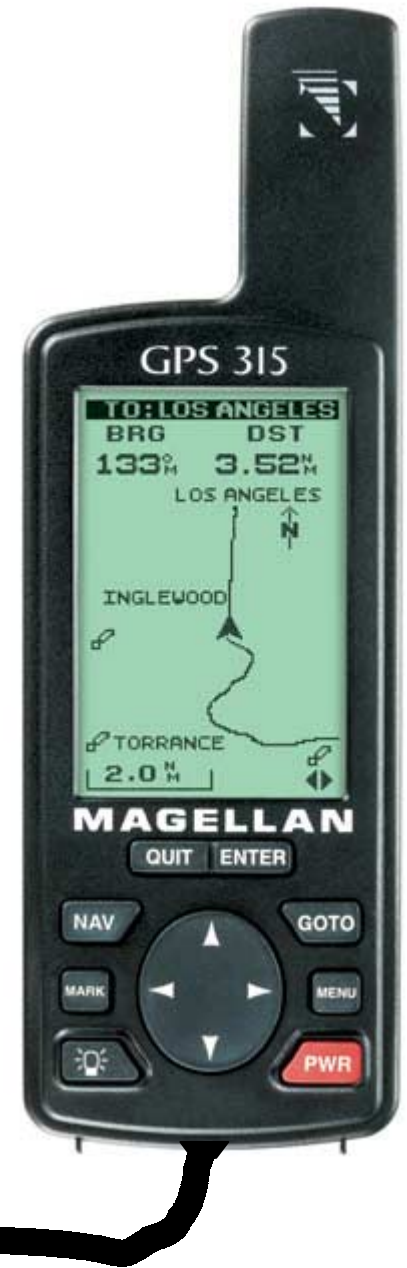
Digital Data Collection

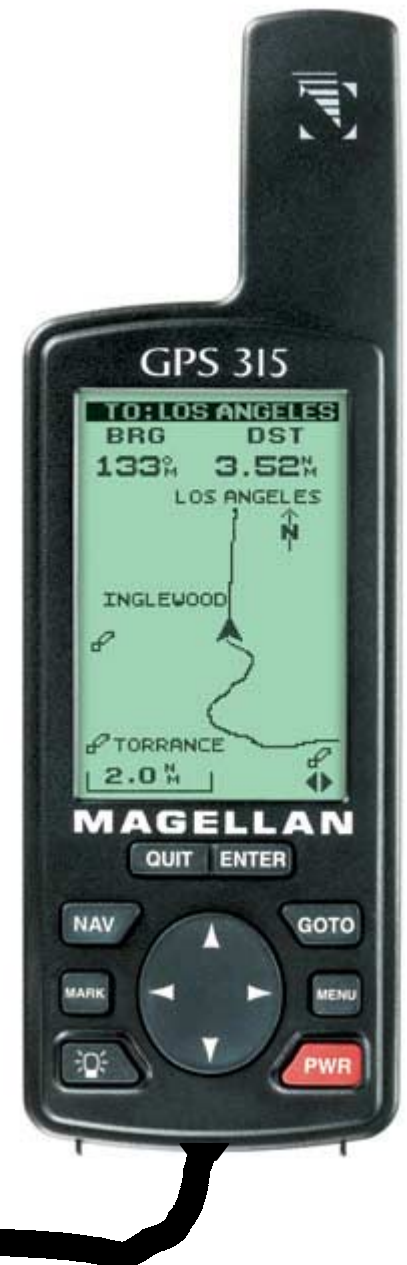
Example:

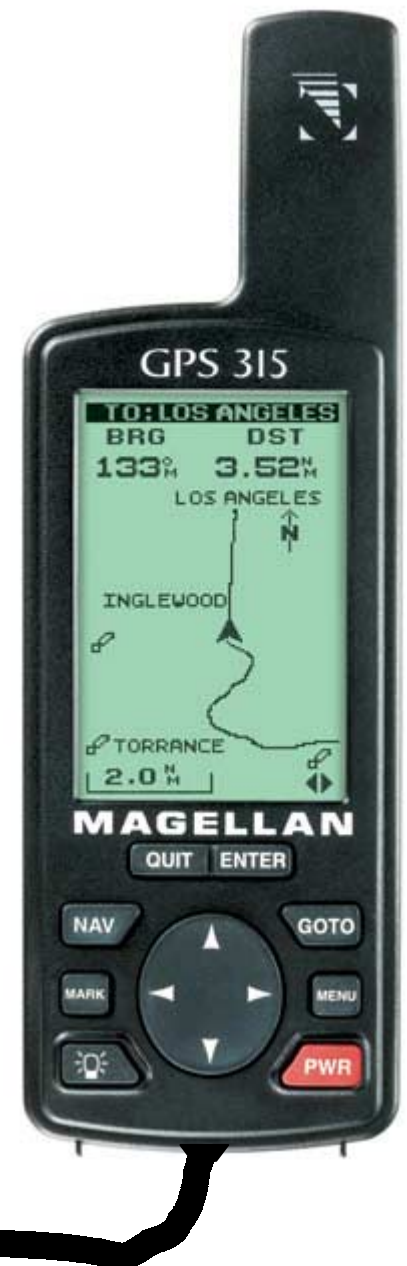
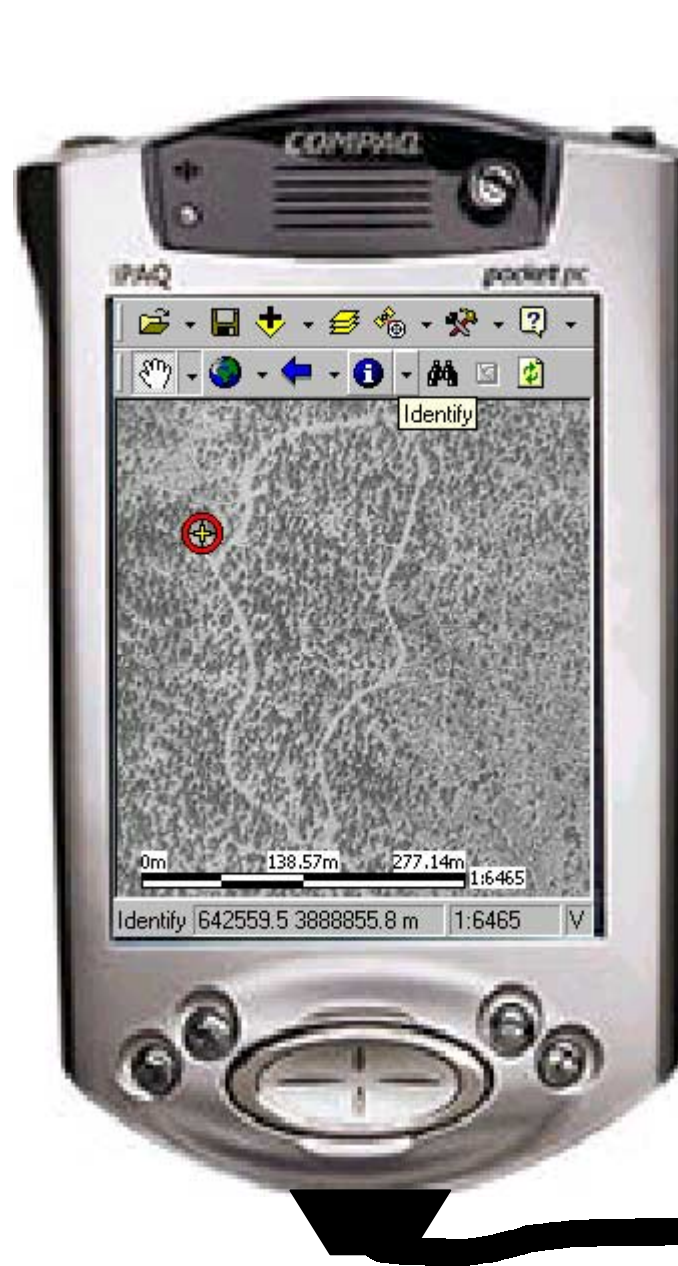
Inventory of
unofficial
campsites in
Mojave
National
Preserve

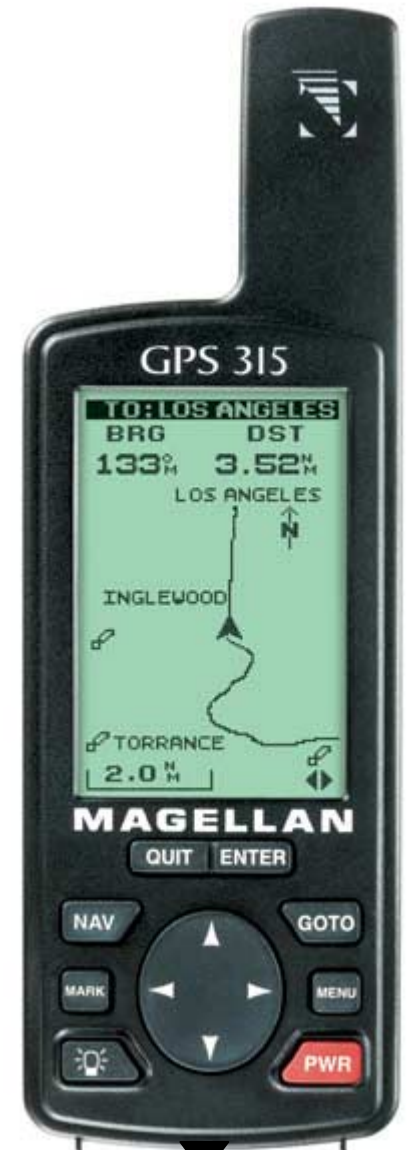






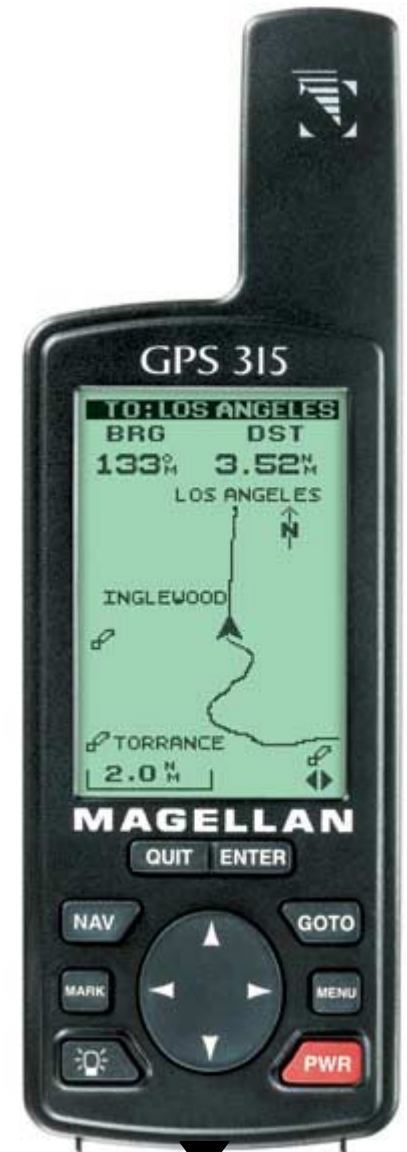






Collect data for
campsite
inventory

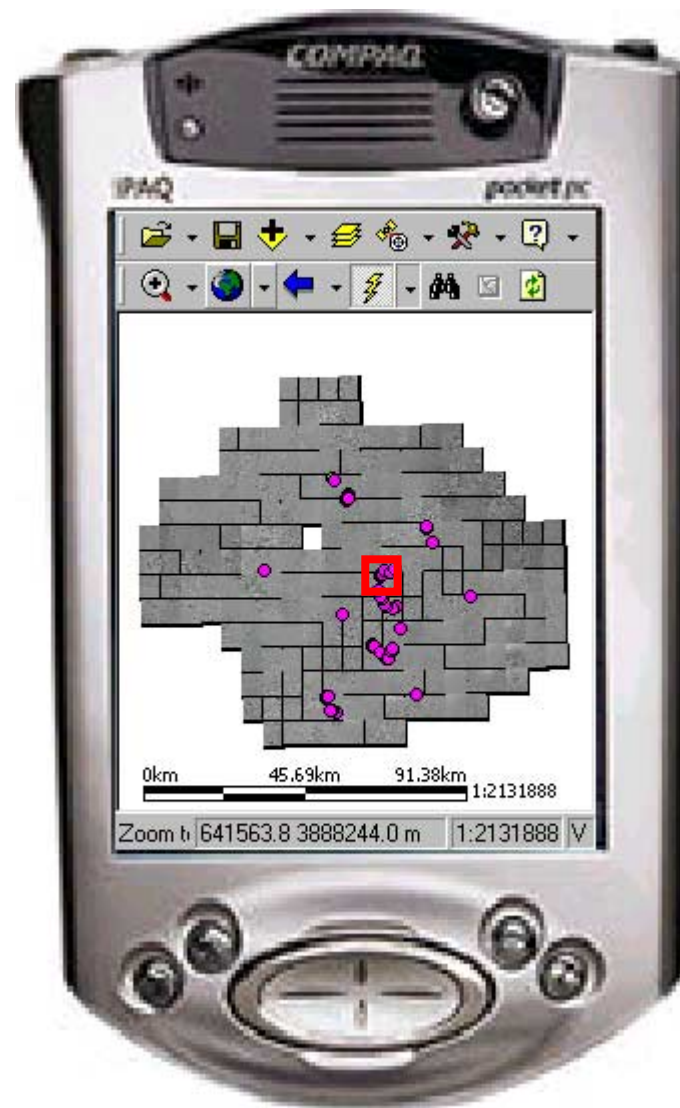


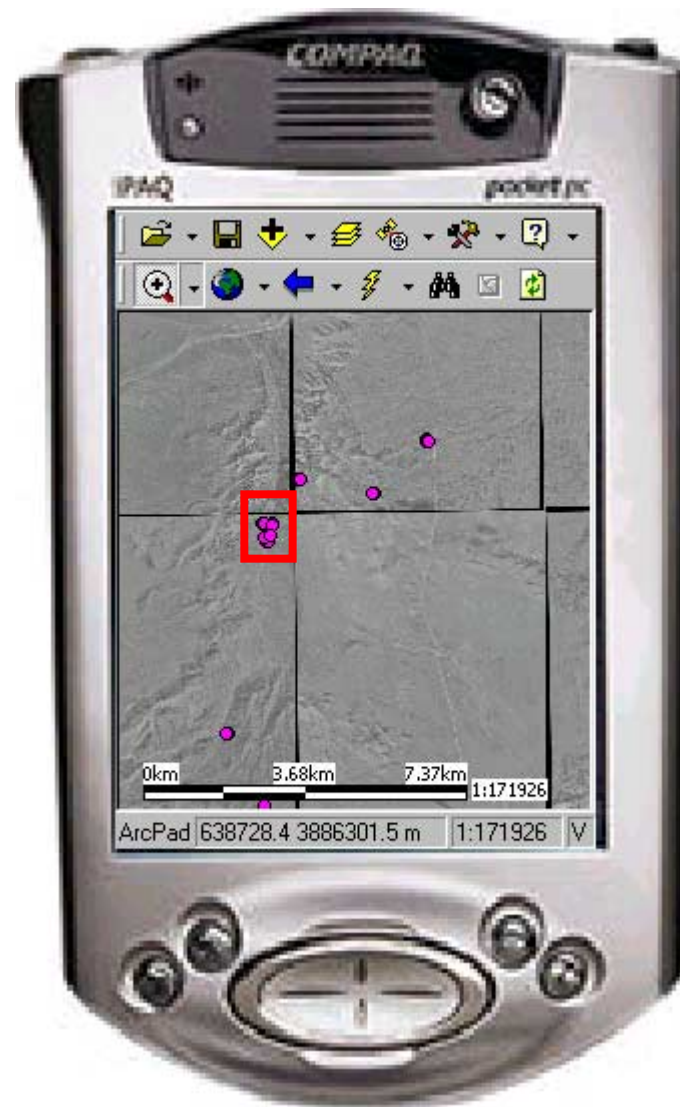


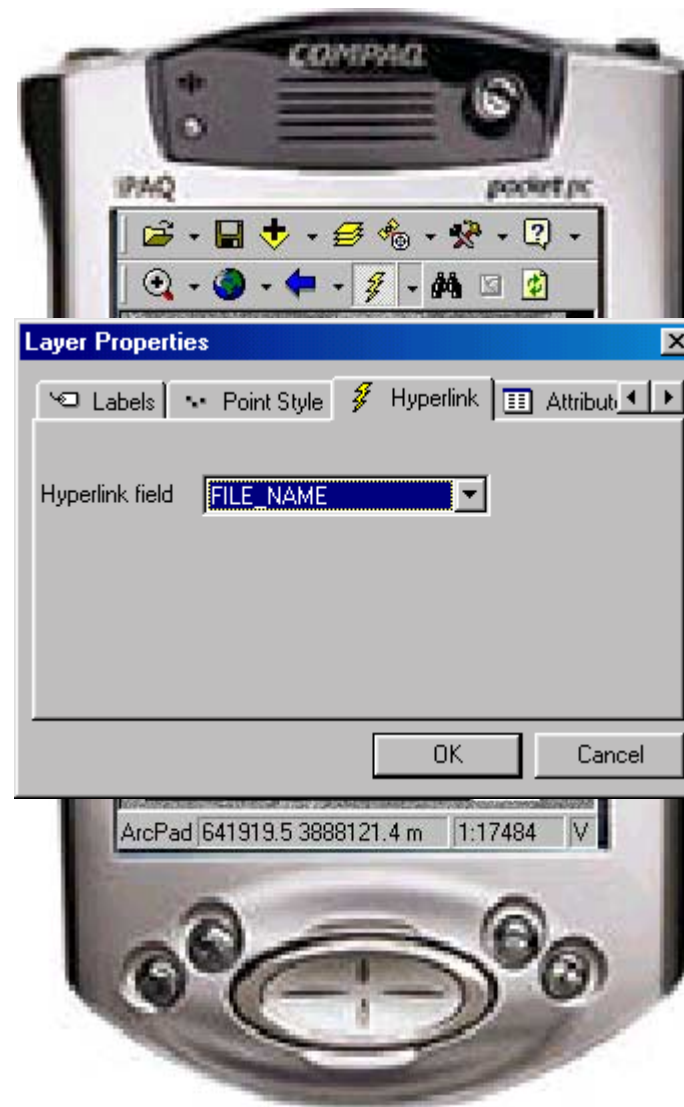
Collect
information on
campsite photo













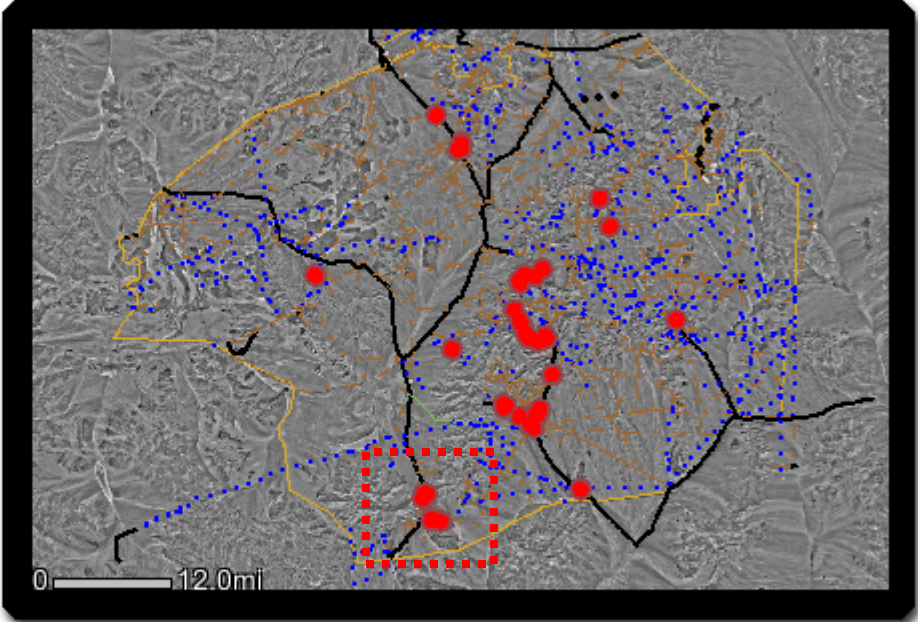
Data Access via the Web


Mojave Desert Ecosystem Program - ArcIMS Session - Microsoft Internet Explorer

Mojave Desert Ecosystem Program - ArcIMS

Legend


☒ camphotos
☒ backcamp
☒ mojardf
☒ boundarymp
☒ background
☐ no background





UTM:

Update Map

 **Tool Tip** **Legend Layer:** To turn the visibility of a layer on or off click on the left checkbox. To view the legend click on the plus or minus sign. You can rearrange the render order by dragging layers up and down in the list.

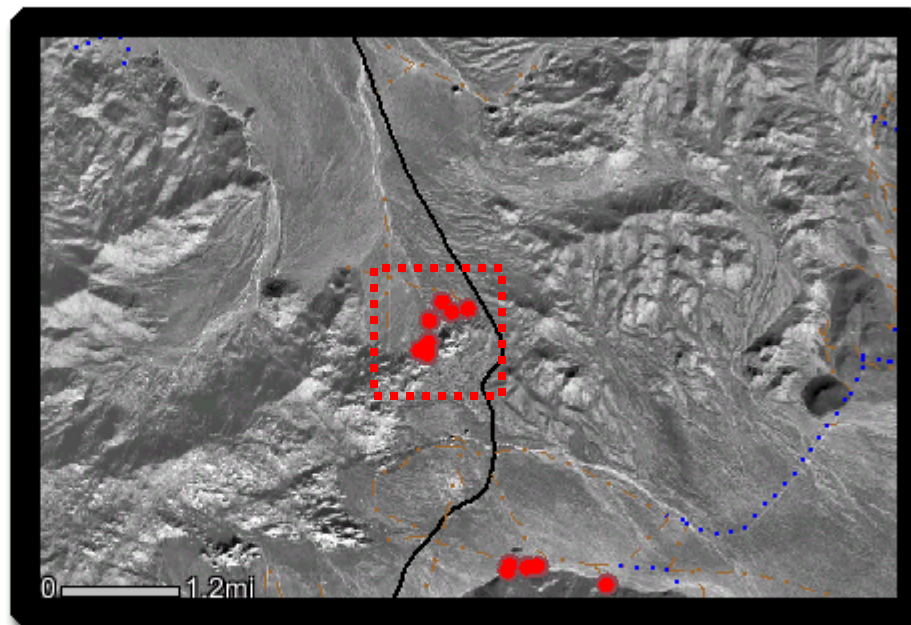
Mojave Desert Ecosystem Program - ArcIMS

Legend

- ☒ camphotos
- ☒ backcamp
- ☒ mojardf
- ☒ boundarymp
- ☒ background
- ☐ no background

Bookmarks

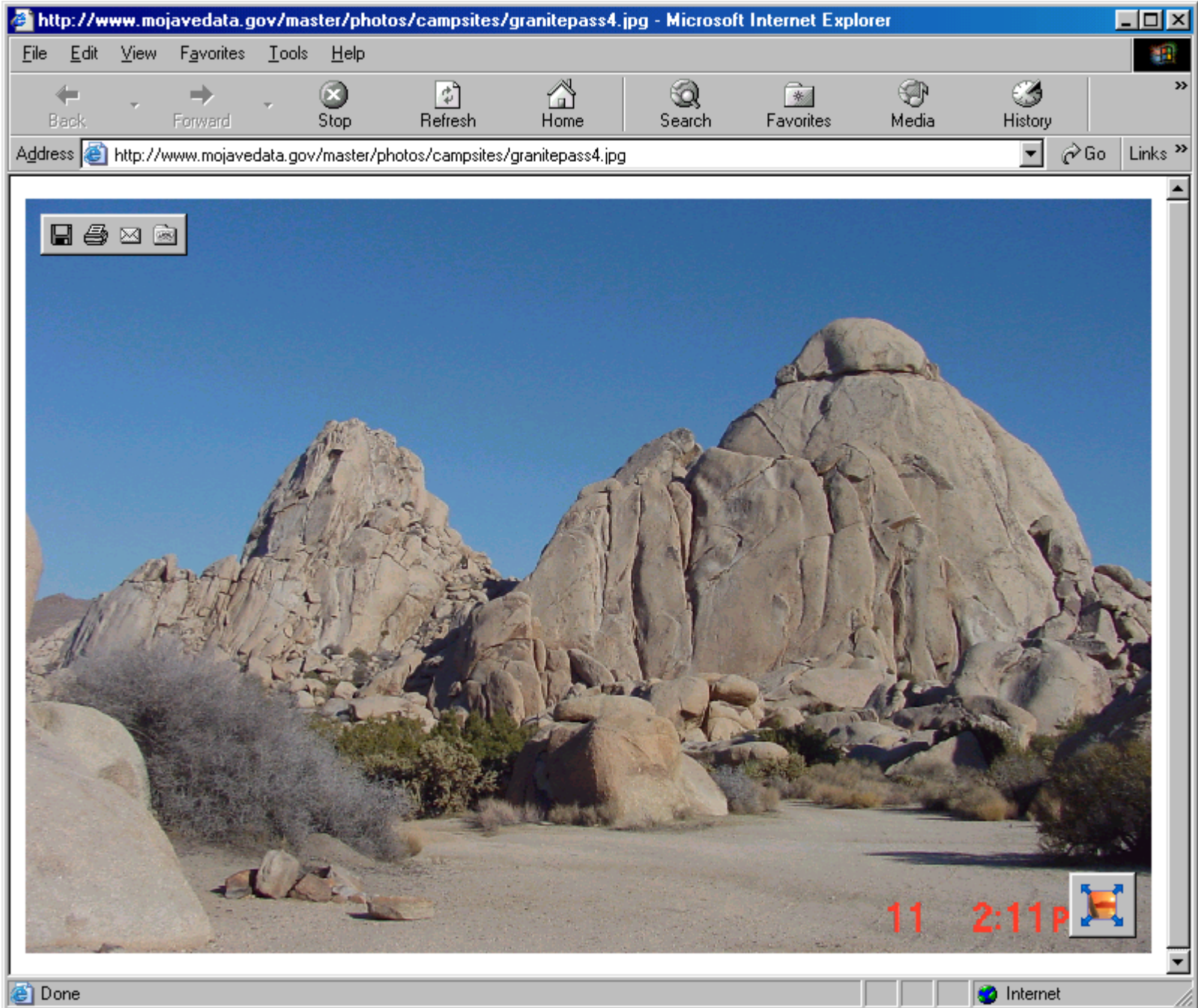
Update Map



UTM: (620053, 3849087)



Pan: Move the mouse over the map, hold down the left mouse button, and drag the image to pan the map to a new location.

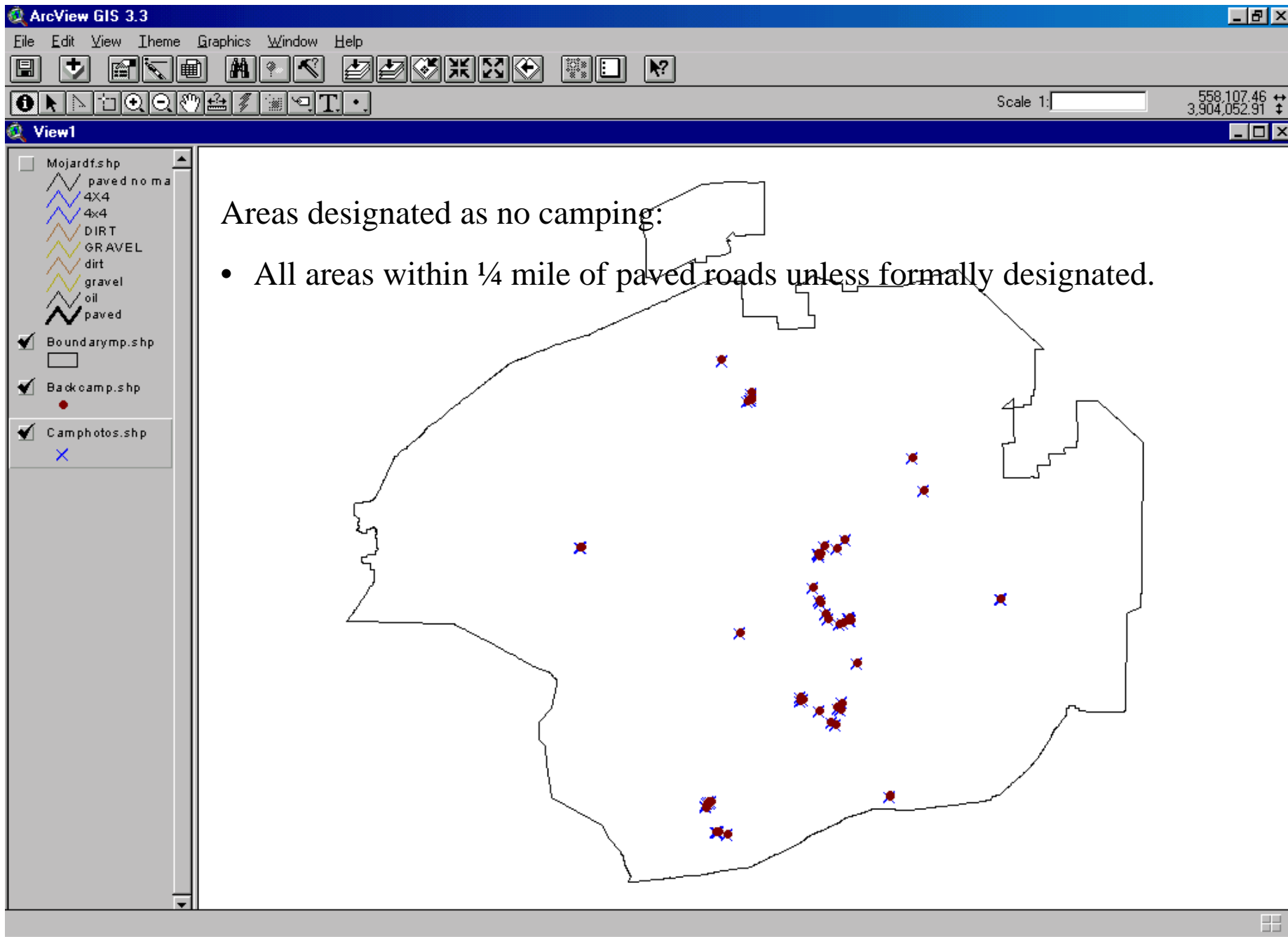


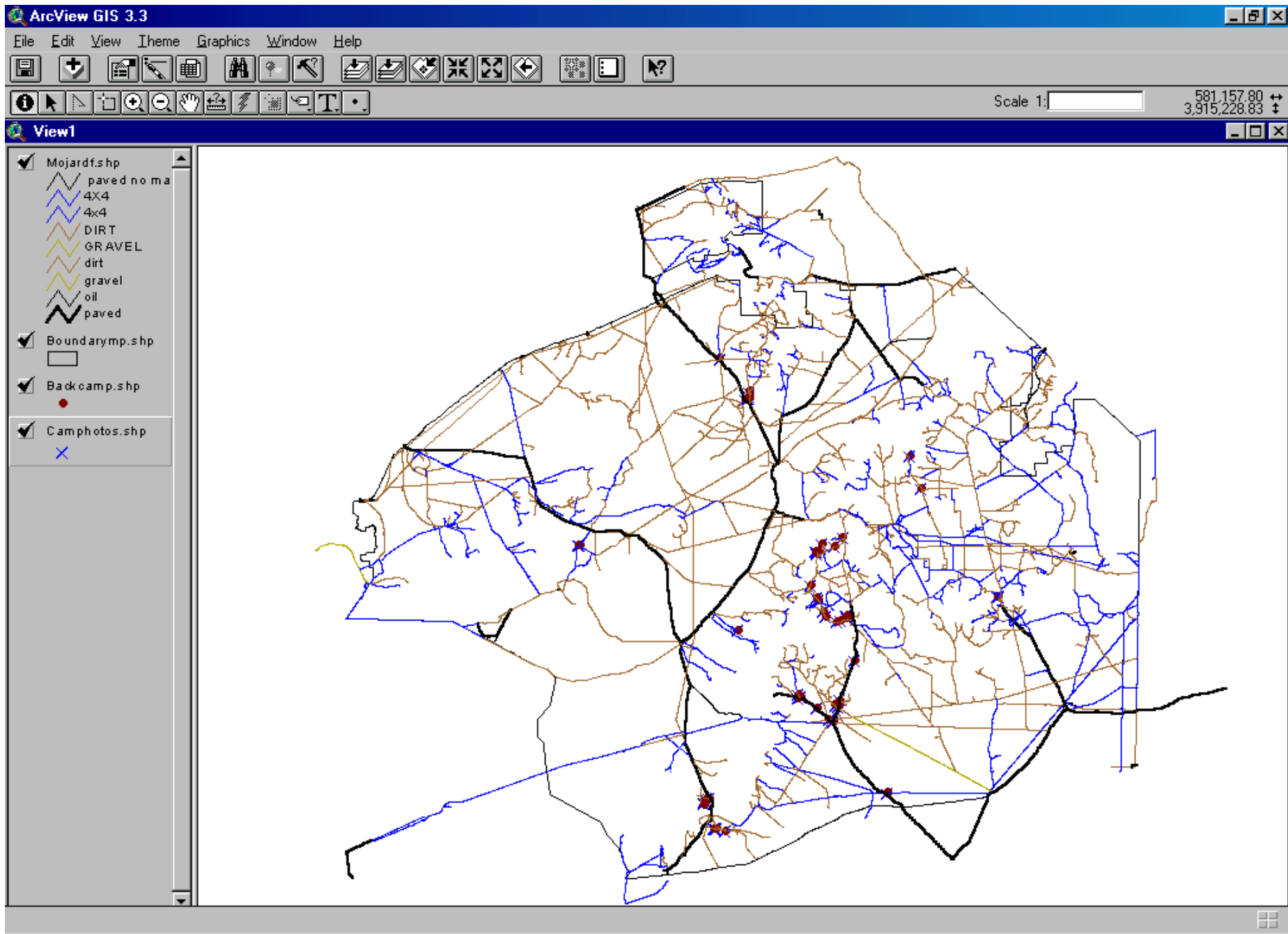
Data Collection

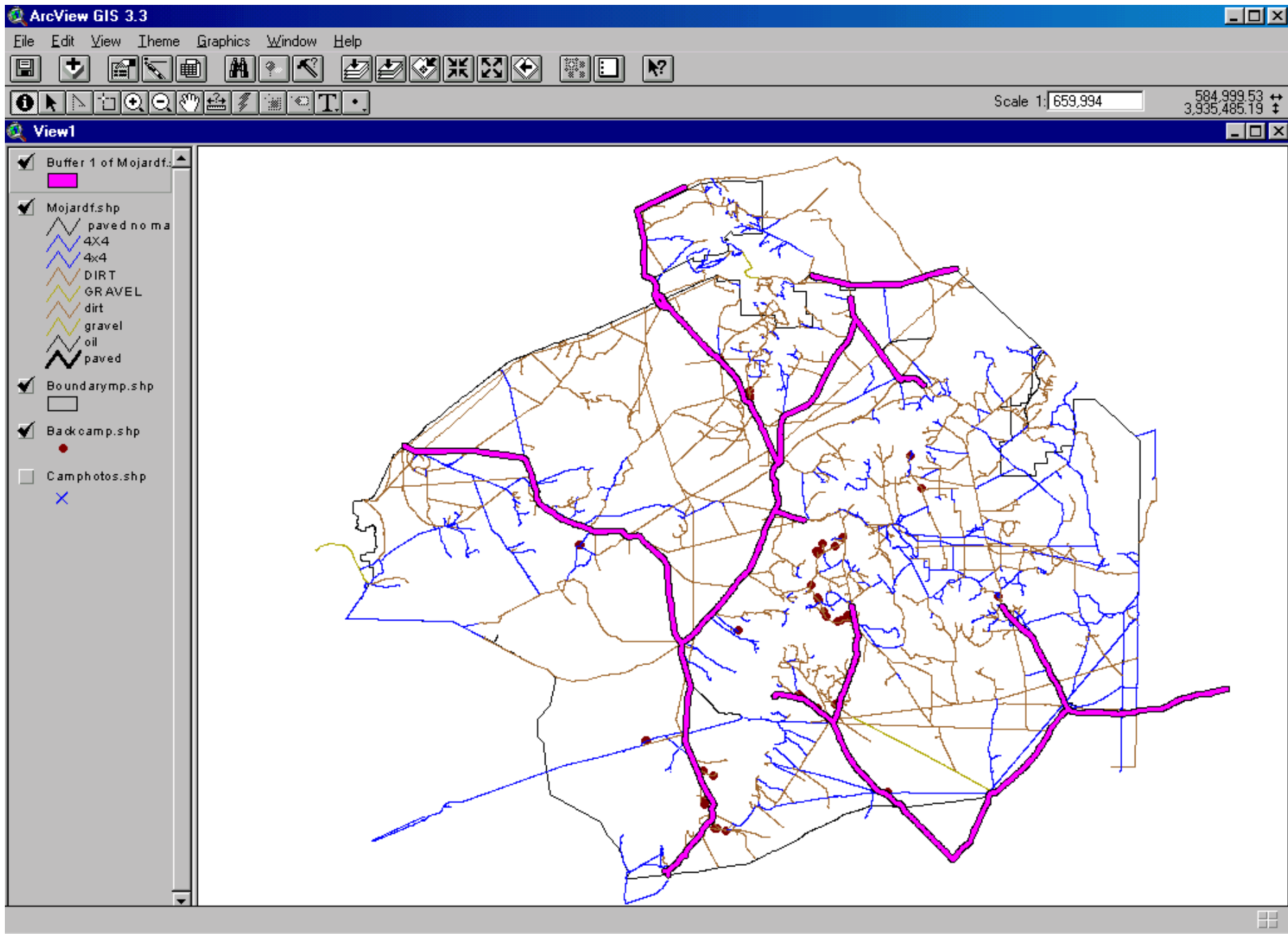
- Accumulate data collected by numerous individuals working independently
- Access data remotely via the web
- Every individual in the field has a copy of the latest data
- Data collection is standardized via the electronic form

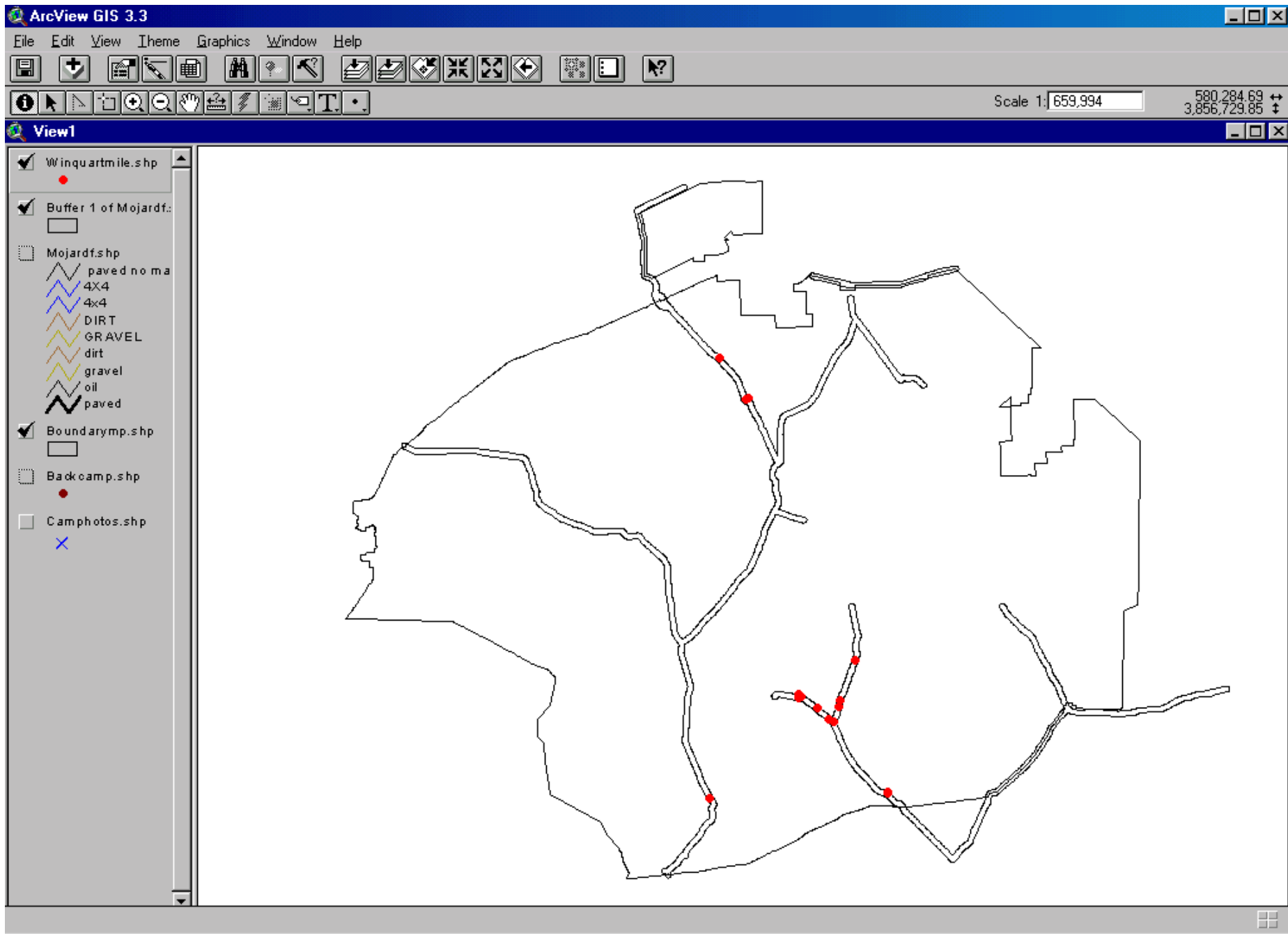
Analysis and Modeling with ArcView

- Using built-in Arcview 3.3 functions









ArcView GIS 3.3

File Edit Table Field Window Help

0 of 16 selected

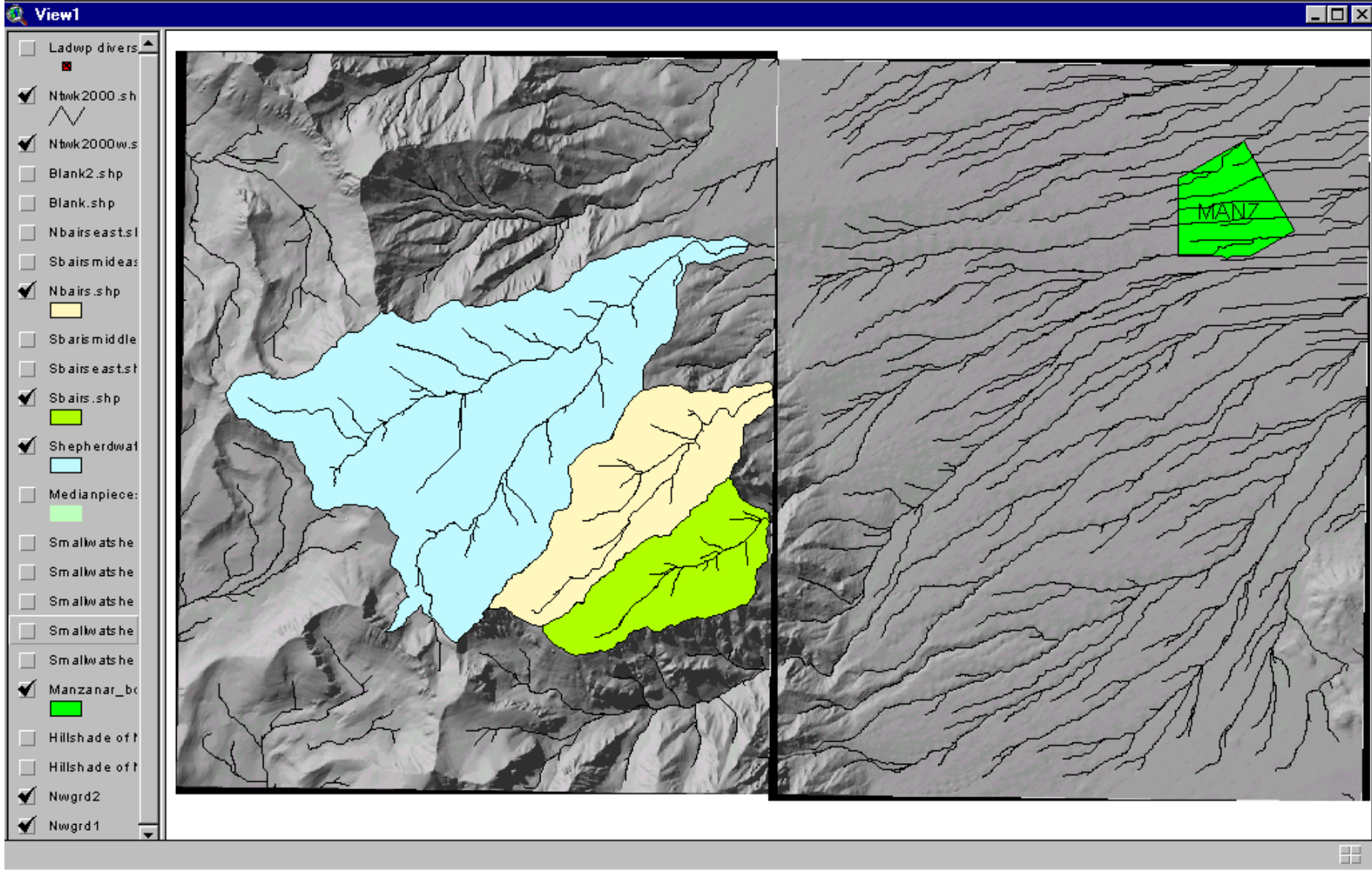
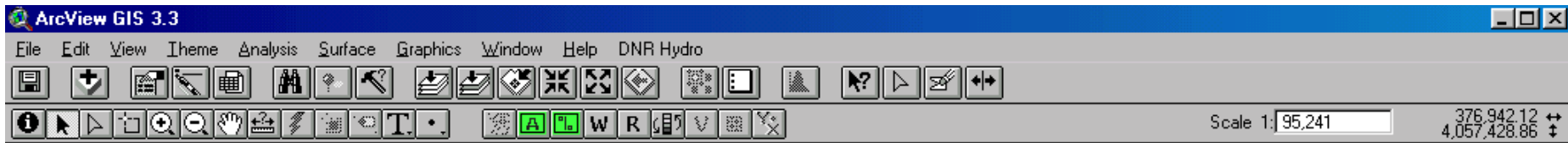
Shape	Locale	Maxvehcap	Optvehcap	Area_m2	Disturbint	Disturbage	Trash	Ashdump
Point	mittchell cavern SP	3	1	190	moderate	intermediate	none	
Point	The Cross	3	1	550	moderate	recent	none	
Point	The Cross N	2	1	105	moderate	recent	little	
Point	Kessler Peak 0	2	1	290	moderate	occupied		
Point	Corral & Stocktank	15	3	15500	extensive	occupied		
Point	Granite Pass 1st	2	1	250	moderate	intermediate	little	
Point	Blind Hills	10	2	1200	extensive	recent	little	only in firepit
Point	Blind Hills	10	2	1000	extensive	occupied	some	
Point	Mitchell Caverns SP	1	0	100	light	intermediate	none	only in firepit
Point	Mitchell Caverns SP	1	0	100	light	intermediate	little	scattered
Point	Mitchell Caverns SP	2	1	500	moderate	recent	some	none
Point	Mitchell Caverns SP	0	0	0		occupied		
Point	Essex/Black Canyon Intersecti	5	0	2700	severe	occupied	some	none
Point	Black Canyon Rd	2	1	150	moderate	recent	little	scattered
Point	Black Canyon Rd	0	0	0	extensive	occupied		
Point	Black Canyon Rd	5	0	1000	extensive	recent	little	scattered

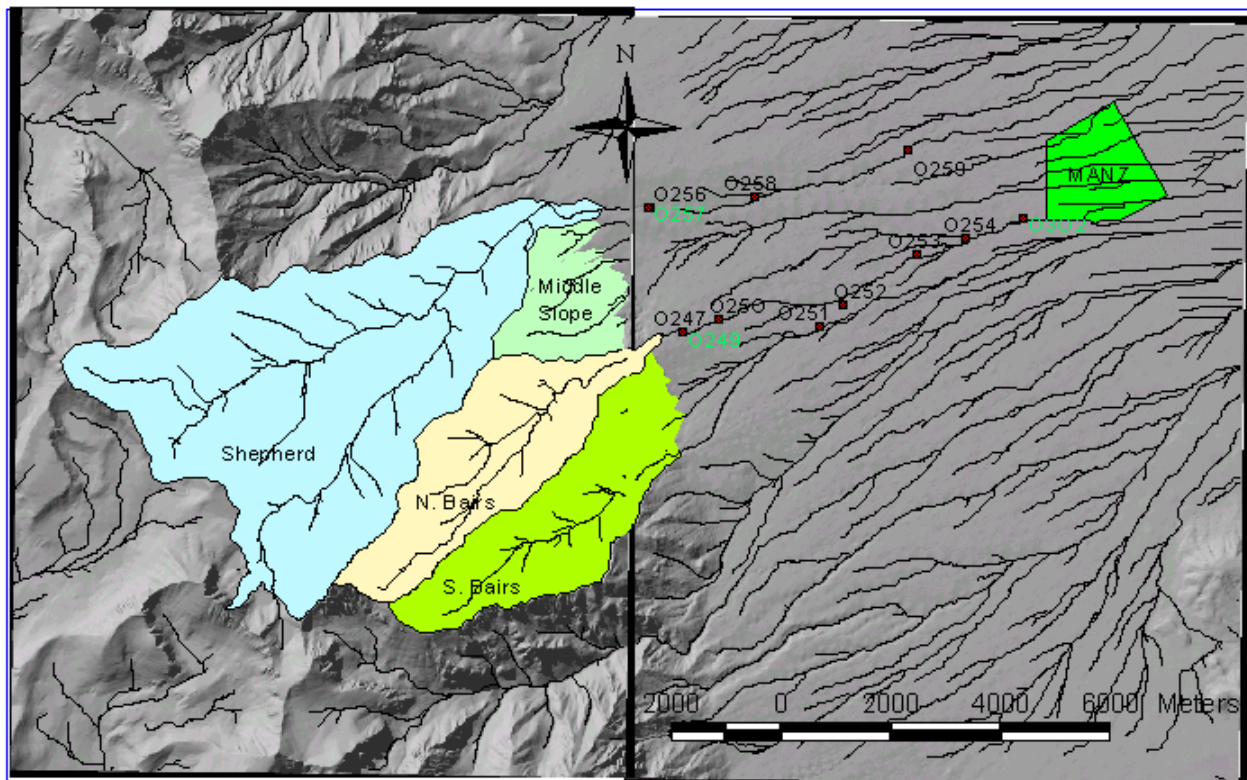
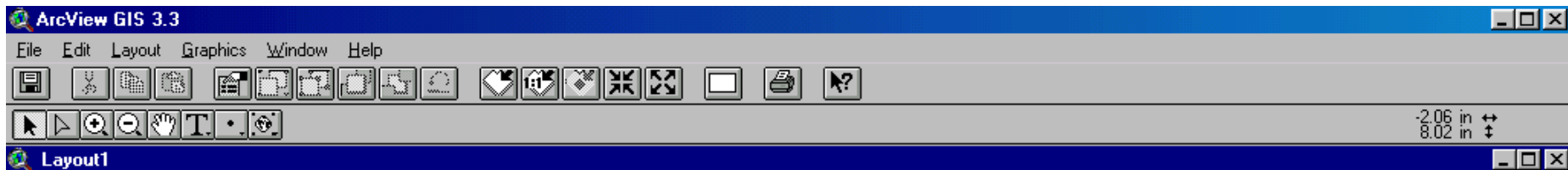
An aerial photograph of a landscape. In the foreground, there's a road and some fields. In the middle ground, a river or stream flows through the landscape. The background shows more fields and some distant hills or mountains. The overall tone is somewhat muted, with a lot of browns and greys.

Analysis and Modeling with ArcView

- Using custom developed extensions and scripts
- Example: Watershed and stream channel analysis at Manzanar using the Minnesota Department of Natural Resources Hydrology Extension
- Lots of resources available on the web

10/18/2001





GIS Modeling Applications

- Limited by imagination and programming ability
- Lots can be accomplished with Arcview functions
- Capabilities expanded by extensions and scripts
- Many applications can be downloaded for free

Monitoring by repeat photography

- Incorporating the time component

Mojave Desert Ecosystem Program - ArcIMS

Legend

- ☒ camp
- ☒ back
- ☒ moja
- ☒ boun
- ☒ back
- ☐ no b

mojardf - N
backcamp - extensive
camphotos - granitepass4.jpg
camphotos - granitepass4a.jpg
camphotos - granitepass4b.jpg
camphotos - granitepass4c.jpg

Clear

Clear All

Zoom

camphotos - granitepass4c.jpg

AZIMUTH 90

TIME 1310

PHTOGRHER dlh

FILE_NAME [granitepass4c.jpg](#)

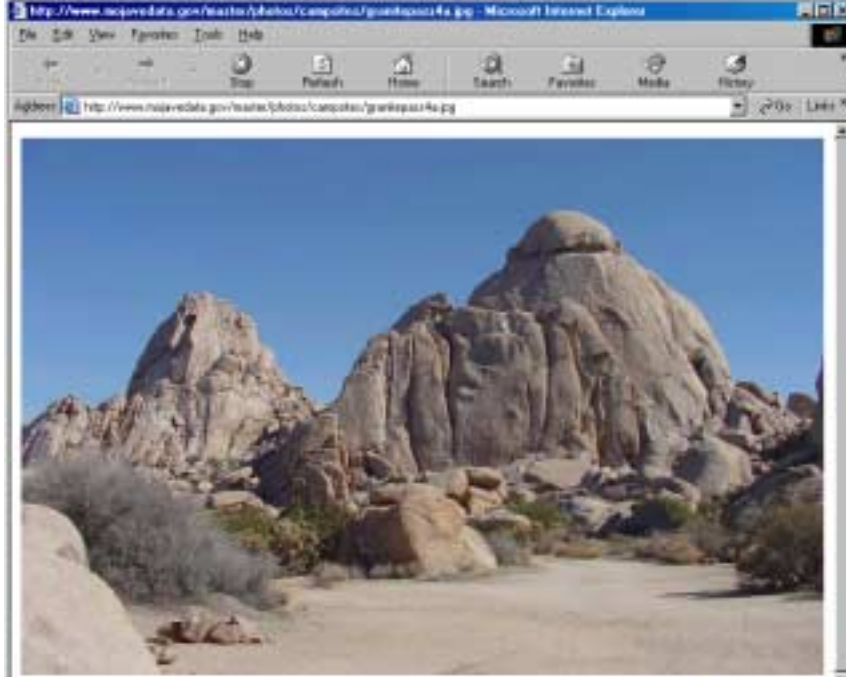
DATE 1044662400000

Update Map



UTM: (626030, 3852651)

If you need help with the ArcIMS Session, [please click here](#)



Monitoring by repeat photography

- Hyperlinked GIS layers are a convenient way to organize monitoring photography.
- Shape file data used to collect and organize monitoring information are the same as used for web-based distribution.
- GIS layers are created in the field with pertinent information, centrally managed/archived, and distributed via the internet.

Comments ? Questions?